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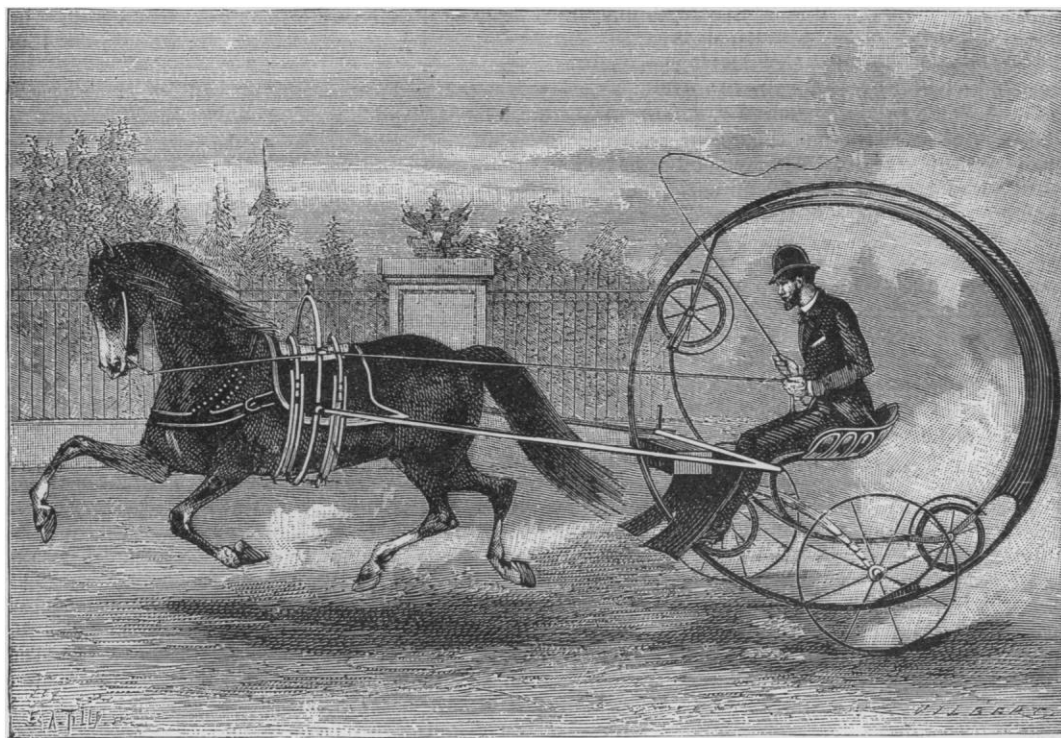
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same date, at Fallstown, Ind. On the 30th a wide-spread shock was felt in California.

### *L'HIRONDELLE.<sup>1</sup>*

THIS name we find given to a carriage which is the result of one of the recent attempts to gain for the ordinary road-vehicle the ease of traction which a rail gives. It might be better to say that the actual result is the use of a

screen is furnished behind, to give protection from the mud and dust, which, carried up by the outer ring, would be dropped on the hapless occupant. To give the whole stability, there are two outriding wheels connected with the main part by springs, flexible enough to allow of the main weight being borne by the central wheel, and yet sufficiently stiff to prevent any overturning. The most of the parts are made of wrought iron or steel. It has been found that the carriage is not liable to



L'HIRONDELLE.

much larger wheel than any that can be used in the ordinary way, and so the advantage which a large wheel gives in passing over obstacles on a rough road. The form shown in the cut is said to have been used in Poland and Russia with considerable success, and carriages of this type to have made their appearance in Paris. The driver's seat is connected rigidly with the shafts and with the three small grooved wheels which are made to fit the inner surface of the large steel ring, or wheel proper, which rolls on the ground. A

accident, and, with ordinary care, may be kept in running-order.

### *THE GREAT COMET OF 1882.<sup>1</sup>*

THE accompanying sketches are intended to give an idea of the appearance of the nucleus of the great 1882 comet, in the 26-inch Washington equatorial, on the evenings of Feb. 1, Feb. 23, and Feb. 27, 1883. A magnifying

<sup>1</sup> This article, and the cut accompanying it, are taken from *La Nature* of April 14.

<sup>1</sup> Communicated by permission of Vice-Admiral Rowan, superintendent U. S. naval observatory.

power of about 200 diameters was used on each occasion for making the sketches.

Fig. 1 shows the comet on Feb. 1, 1883, at about the time of meridian transit, or 9h.,

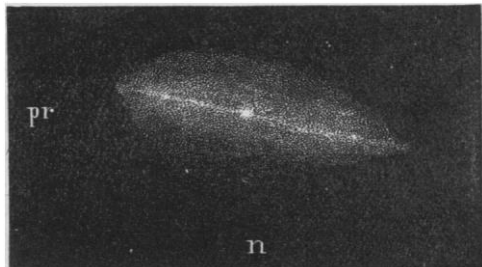


FIG. 1. Feb. 1, 34, 1883.

Washington mean time. The nucleus which I first saw in any degree 'separated,' on the morning of Oct. 7, 1882 (its entire length at that time being about 25"), has now stretched out into a fine straight line of light, with three quite bright and stellar-like points of condensation. No micrometer measures were made; but, from a rough estimate, the distance between the two preceding points was about 35", and the distance from the middle to the following point about 42", the total length of the nucleus proper being about 80". The middle point was the brightest. The head shows no very definite outline, but on the south side it is somewhat brighter and more sharply defined than on the north.

Fig. 2 shows the comet on Feb. 23, 1883, just after meridian passage, or about 8h., Washington mean time. I can see but little change in the appearance of the nucleus since the first of the month, or, indeed, since the first part of December, except a gradual diminution in brightness. Three bright points are still visible. The middle one is brightest, and

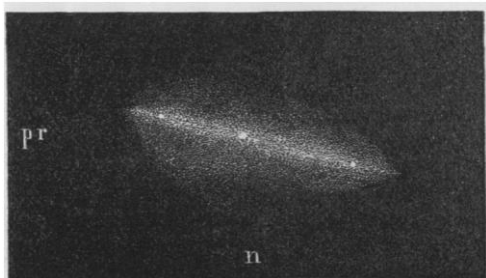


FIG. 2. Feb. 23, 34, 1883.

about equal to a star of the twelfth magnitude; the point preceding is a little fainter than this;

and the point following is the faintest. The light seems to be more concentrated near the preceding end. The position angle of the following point from the preceding was 76.5°; but the poor seeing and the increasing moonlight rendered it impossible to make any accurate measurements of the distance between these points.

Fig. 3 gives the appearance of the comet on Feb. 27, 1883, at about 8h. 30m., Washington mean time. The seeing was remarkably good, and the nucleus was examined with magnifying powers of 200 and 383 diameters. Four bright points were seen distinctly, and a fifth (following) suspected. Numbering these points of condensation in their order from the preceding end of the nucleus, 3 is decidedly the brightest, 2 next, 4 next, and 1 the faintest.

Professor Hall made a number of measurements of the distances of these points, and he has kindly furnished me with the following results of his observations:—

$$\begin{aligned} 2 \text{ to } 3 &= 34.5'' \\ 2 \text{ to } 1 &= 48.1'' \\ 3 \text{ to } 4 &= 22.3'' \end{aligned}$$

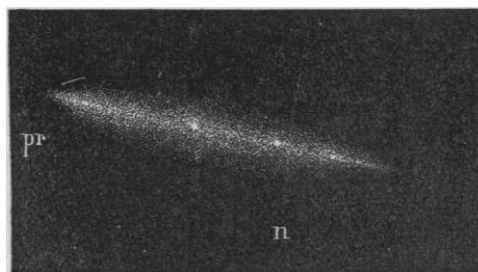


FIG. 3. Feb. 27, 36, 1883.

Position angle of the line joining 1 and 4 = 78°. This gives for the distance between the extreme points 1' 44.9". Using a value [0.45885] for the logarithm of the distance from the earth, interpolated from Professor Frisby's ephemeris, the apparent distance between our extreme points of condensation is 135,000 miles. If, however, these points lie on a line pointing from the sun, as this line makes quite a small angle with the line of sight at the time of observation, the real distance of our two points is about three times this value, or, roughly, 400,000 miles.

The comet was last observed on the 3d of March, but it is hoped that further observations can be obtained after the moon has passed.

W. C. WINLOCK.